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Design of Business Media - An Integrated Model of Electronic Commerce

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Introduction

Information and communication technology (ICT) enables and demands entirely new ways of doing business. Two of the challenges nowadays are (1) to find new business models for Electronic Commerce and (2) to establish platforms with comprehensive integrated services for Electronic Commerce. The forthcoming challenge is (3) to design platforms accessible both for (software) agents as well as for humans.

We provide a general model for media to describe communities and their platforms as communities of agents resident on an organized channel system. Then, we provide with the business media framework a general architecture for media comprising and relating business and ICT perspective. We discuss those models and apply them to the case of amazon.com – an application considered to be successful in terms of business model as well as ICT infrastructure.

Media Model

Our model of media, envisions media as spheres for communities of agents and models them as organized channel systems for multi-agent systems [Schmid 97, Schmid 98]. Figure 1 depicts this notion.

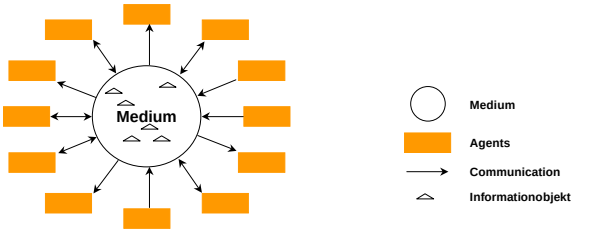

Figure 1: Media Model

Media are described with three components [Schmid 97, Schmid 98]:

- The *Organization* consists of a collection of roles and protocols. The roles describe the assets and liabilities of agents, i.e., the behavior expected from agents within the community. The protocols describe the interactions between agents via the platform.
- A system of *Channels* distinguishes and distributes agents over space and time and facilitates coordination. It corresponds to the notion of a medium as a mere carrier of information.
- *Logical space* with (1) a *logic* to formalize representation of information about some domain of discourse on the carrier and (2) *possible worlds* to bind the syntax to its semantics.

This organized set of channels is employed by

- *Agents* capable of processing information. Agents activate the information represented on and transported by a medium and turn information into knowledge. This knowledge enables them to act autonomously on the platform.

Communities of agents constituted by a medium can be part of encompassing media and agents may participate in various roles in several media. This yields a net of interwoven media – a MediaNet

We claim that the structures in ICT and the structures found in organizations converge. Distributivity, modularity, decomposition, disintegration, dynamic and web-like organization characterize both the ICT-infrastructure as well as business communities in the digital economy with its value webs and flat organizations. Thus, we conclude that design principles for communities of all kind, in particular, business communities and design principles for distributed, open systems converge as well. The media model is herein a model of the ICT-infrastructure and of the communities.

Business Media Framework

The Business Media Framework (BM framework), takes a business oriented perspective on new media [Schmid 98, Schmid/ Lindemann 98]. It relates and interprets the components of the general media model in the business context, thus providing a means for the design and management of business communities as well as the ICT-infrastructure.

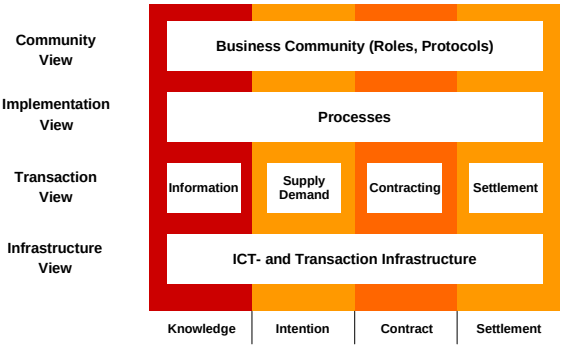

Figure 2: Business Media Framework

Let us explain the media reference model with the views and phases as depicted in Figure 2: The *community view* covers the business perspective of new media. Here, business model, strategies, normative aspects, the roles of actors with liabilities and assets and protocols about the interactions and transactions are described. The *implementation view* implements the transactions in

compliance with the community view by using the generic services of the *transaction view*. The *infrastructure view* provides communication and coordination mechanisms for relating agents of the transaction view as well as the agents taking the roles modeled in the community view.

The reference model distinguishes four phases of a business transaction: In the *knowledge phase*, information is gathered, processed, and disseminated. The common logical space is being established. The *intention phase* provides services for analyzing information. In the *negotiation phase*, a contract is negotiated which is settled in the *settlement phase*.

The business media framework integrates the business and the ICT-perspective giving an holistic view on business media.

Business Medium for amazon.com

We illustrate our approach with amazon.com [amazon 99], following the structure of the BM framework and employing the terminology of the media model. Hereby, we focus on main aspects of this business medium, not claiming completeness. Furthermore we restrict ourselves to amazon.com as a bookseller.

We proceed as follows. First, we give the definition of the business community. From the requirements of this community we derive the services and infrastructure needed to implement the organization and protocols of the community. Finally, we state the processes which implement the interaction within the business community integrating the identified services.

Community View

In general, the (primary) business community resident on the business medium consists of the suppliers and customers of a good or service which satisfies certain wants of the customers. In the case of amazon.com, the customers have a want for information or entertainment which is met by offering books.

Business Model

It can be asssumed that -as any business- the major goal of amazon.com is maximizing its profits. Therefore, as many customers as possible should be attracted and bound to the online shop. Thus, amazon.com provides as added value compared to physical bookstores as well as to other online bookstores a broad assortment of goods, fast delivery, integrated handling of the whole transaction and especially high quality information services.

For obtaining and managing knowledge about their customers, amazon.com relies on automatic techniques. The customers' behavior is being analyzed, enabling the individualization of the services to the needs and interests of the single customer. In doing so, amazon.com increases switching and locking costs.

Since, as in most EC businesses, no trust relationship from the user to the provider can be expected, amazon.com puts strong efforts in establishing trust towards their service and in reducing the risk of using the service. One can differentiate at least three types of risk: The risk of buying an inappropriate product not meeting the customer's demand, the financial risk of the business transaction, and the risk of data security. amazon.com builds up trust first of all by means of the provision of a good service and therefore good experiences over time.

amazon.com establishes a community among its customers, which is visible to and accepted by the single user. It employs this community as source and target of a knowledge cycle [Stanoevska/ Schmid 98], where customer information flows back to the information system and is provided to the users.

Roles and Protocols

The primary roles of customer and supplier of the online service can be further refined to sub-roles relating to the four phases of a business transaction.

amazon.com provides individual roles for customers. Those roles are described in terms of user profiles (incl. name, address, delivery address, preferences and personal interests, as deduced from previous purchases). This role has liabilities and assets for accessing personal information. It includes the asset of an individualized service, e.g., by a personal greeting and customized recommendations of new releases.

Protocols have to follow the normative aspects modeled in the community view. Besides, amazon.com has to adhere to general law, the arising Internet law as well as Netiquette.

The process of a business transaction follows the usual protocols, i.e., the customer has to determine the products he wants to buy, negotiates and signs the contract, which is then settled. However, there are also amazon.com specific protocols, as e.g., "one-click express shopping".

Protocols are designed to establish trust and to make amazon.com take over risk from the customer. (1) amazon.com guarantees to take back all products, with no cost, until four weeks after delivery. (2) Financial risk is limited by credit card payment. SSL connections are employed if possible. (3) The credit card number can be transferred offline via telephone.

Logical Space

The logical space consists of the description of the available products and of the rules guiding the interaction with the platform. The products are specified by bibliographic information, abstract and categories. Thus, a user can find a book by searching for combinations of keywords. Moreover, various semantic relations are established among the book descriptions. (1) Products are sorted into a categorization schema, provided by amazon.com. This gives a static semantic network

browsable by the user. It can also be used to directly find books related to a given book according to their categorization, in a section "Look for similar books by subject". (2) A dynamic semantic net formalizing similarity w.r.t. relevance of books to a customer is given. It relates a book, say X, to those books that have been purchased by most customers which also bought book X. This net can be used to search for books which are relevant according to the above similarity measure, in a section called "Customers who bought this book also bought". This feature visualizes the amazon community with its common logical space, the common ideas and view.

The interactions with the platform, i.e., the roles and protocols, are described only verbally on special web pages.

Transaction and Infrastructure View

The description of the community is complemented by the definition of the services and the infrastructure needed for the realization of the identified business model:

amazon.com offers services for all phases of a market transaction. For the knowledge and information phase, a diverse range of search facilities as well as means for personalization is provided. For settlement, amazon.com offers online payment with credit card implementing the SET standard and employing SSL. Besides, amazon.com relies on services for the collection and analysis of customers' data being used especially for the improvement and individualization of the services. As the underlying infrastructure, amazon.com relies on the Internet with the standard protocols.

Implementation View

We mention here three processes: (1) the process implementing the market transaction of a customer, basically following the phases of the business model. (2) the process of gathering information, processing it and feeding it in a knowledge cycle back into the system. (3) the process of community building including all push services of providing customers with information as well as marketing. Evidently, those three processes as well as the services they employ have to be integrated.

Discussion

The Business Media concept provides an holistic approach considering ICT and business perspective. We argue that the same structures are going to emerge in both perspectives. We expect that both the ICT as well as the business communities will establish distributed, open, flat and market-like structures. Accordingly, analogous design methods are going to apply.

In designing platforms and business models, the Media approach stresses the relevance of communities and the power of a management of a community through its platform [Schubert 99]. Thus, the design of a business medium starts with the definition and description of the community, resp. its business model, organization and protocols, which has to be implemented, supported and controlled by the platform. Instead of following an enterprise–centric approach, the media model considers the business community as a whole. This global view reflects the tendency to web-like value structures, where the individual parties, while concentrating on their core competencies, rely on each other to jointly create economic value for their customers.

The community, further restricted to the community of the customers, is important for the development of businesses in general. The electronic platform provides the suppliers with the possibility to analyze and learn about the wants of their customers. Thus, they can react very quickly by reshaping and adapting their services and products.

The study of amazon.com instantiates those models. In employing concepts from computer science, in reconstructing business models, such that the formal reconstruction is understood by agents, our model goes beyond the common notion of Electronic Commerce. It envisions a Digital Economy of agents.

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